iPhone Accessibility

Make your app compatible with VoiceOver

Session 121

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iPhone Accessibility

Make your app compatible with VoiceOver

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Settings > General > Accessibility

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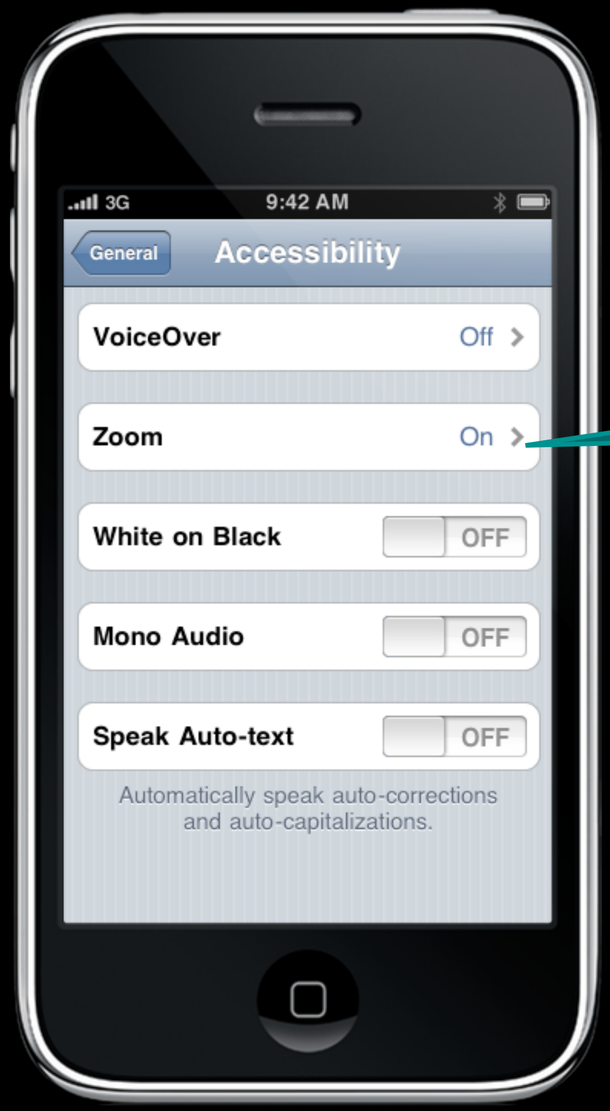
VoiceOver
- Screen access software
- Speaks items on the screen
- Speaks activities and alerts
- Helpful sound effects
- “iPhone simple”
- “Safe touch”

Settings > General > Accessibility



Zoom

- Full-screen zoom
- Panning
- UI control panning
- Edge panning

Settings > General > Accessibility

White on Black

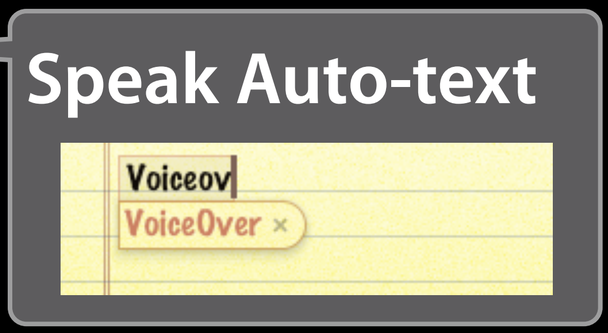
- Inverts the display colors

Settings > General > Accessibility

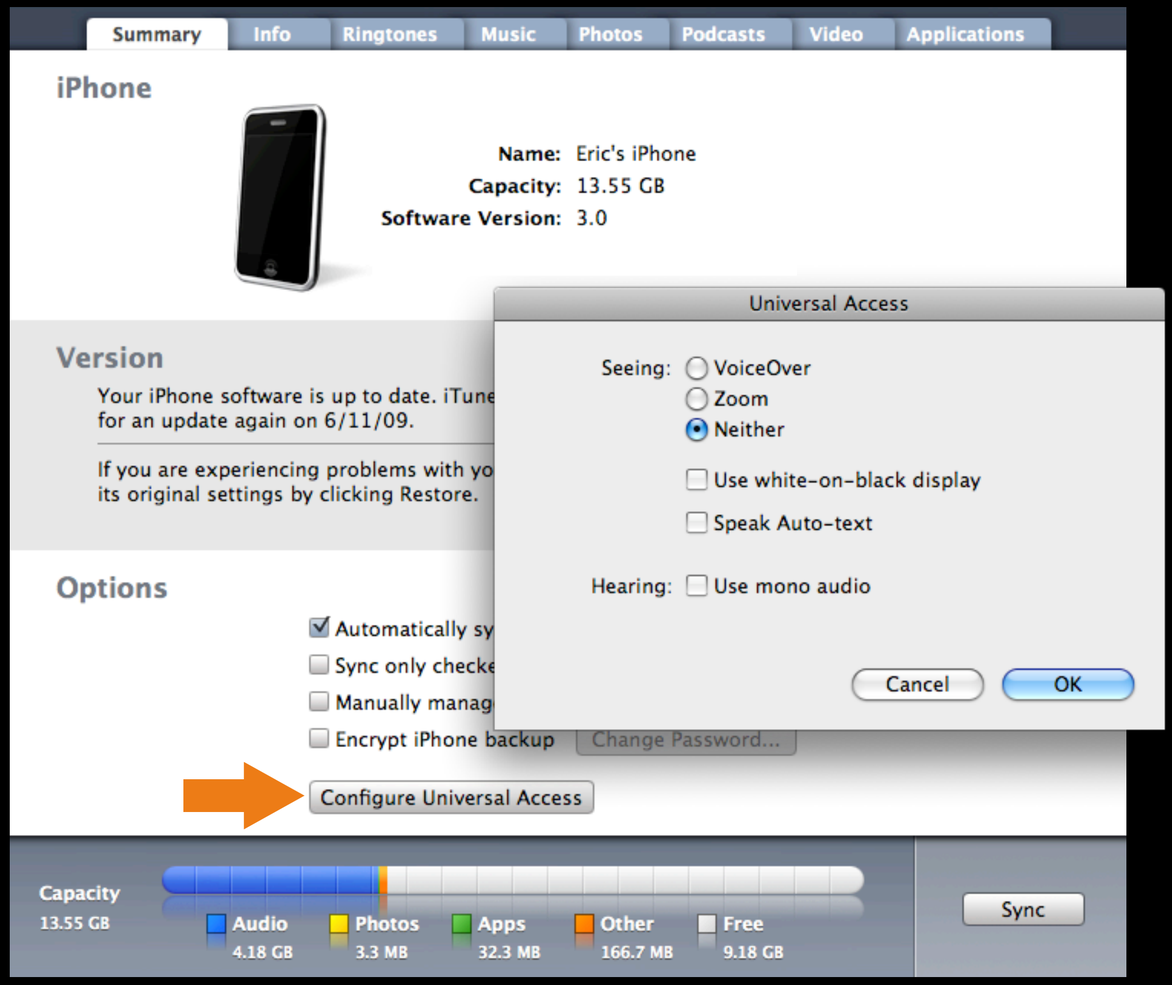
Mono Audio

- Both channels to both ears

Settings > General > Accessibility



Turning on Accessibility



Demo of iPhone Accessibility

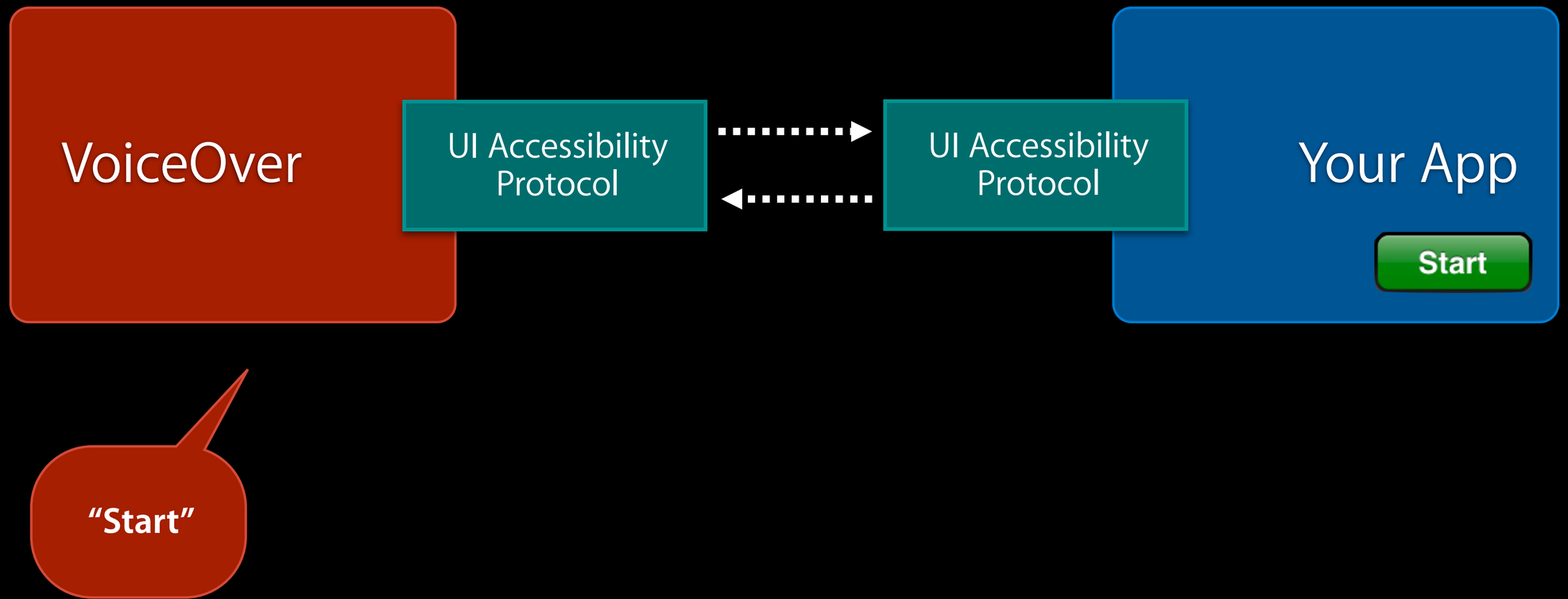
UI Accessibility API and Tools

Chris Fleizach
VoiceOver Engineering

Make Your App Accessible

- UI Accessibility API for iPhone 3.0 SDK New!
- Allows your app to provide UI information to an assistive application

Accessibility Architecture



Adding Accessibility to Your App

- The iPhone Accessibility API is designed for simplicity
- If your app uses standard UIKit controls, most of the work is done
- Many apps will only need to provide labels for UI elements that do not have associated text

Accessibility API: Attributes

- The Accessibility API consists of methods that return information about the element

```
- (BOOL)isAccessibilityElement
- (NSString *)accessibilityLabel
- (UIAccessibilityTraits)accessibilityTraits
- (CGRect)accessibilityFrame
- (NSString *)accessibilityHint
- (NSString *)accessibilityValue
```

Common Accessibility Attributes

- `- (BOOL)isAccessibilityElement`
  - Determines if the object is accessible (it's visible to VoiceOver)
- `- (NSString *)accessibilityLabel`
  - A textual representation of the element

Accessibility Traits

- `- (UIAccessibilityTraits)accessibilityTraits`
  - A set of traits that define status, state, and type

- Traits are OR'd together
- UIKit controls already return appropriate traits
- An element's traits should be OR'd with super

Accessibility Traits

Button	Link	Search Field	Image
Selected	Plays Sound	Keyboard Key	Static Text
Summary Element		Not Enabled	Updates Frequently

Other Accessibility Attributes

`-(CGRect)accessibilityFrame`

- The onscreen rectangle for the UI element

`-(NSString *)accessibilityHint`

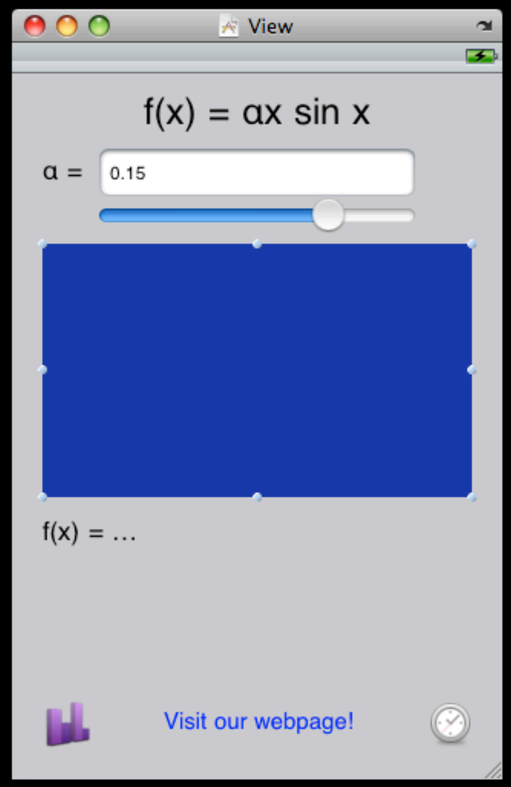
- A string that gives a hint for using the UI element

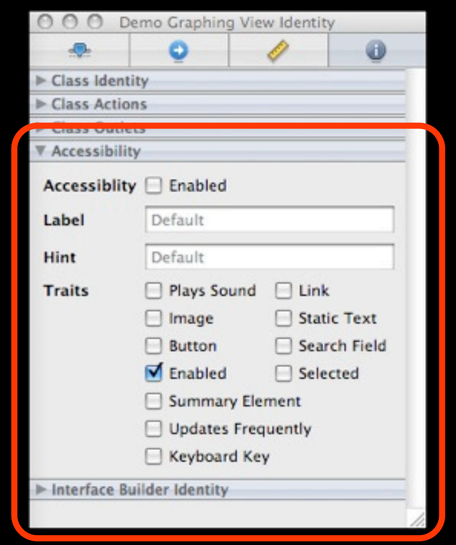
`-(NSString *)accessibilityValue`

- A dynamically changing value that describes the UI element

Adding Accessibility with Interface Builder

- Simple accessibility information can be added with Interface Builder

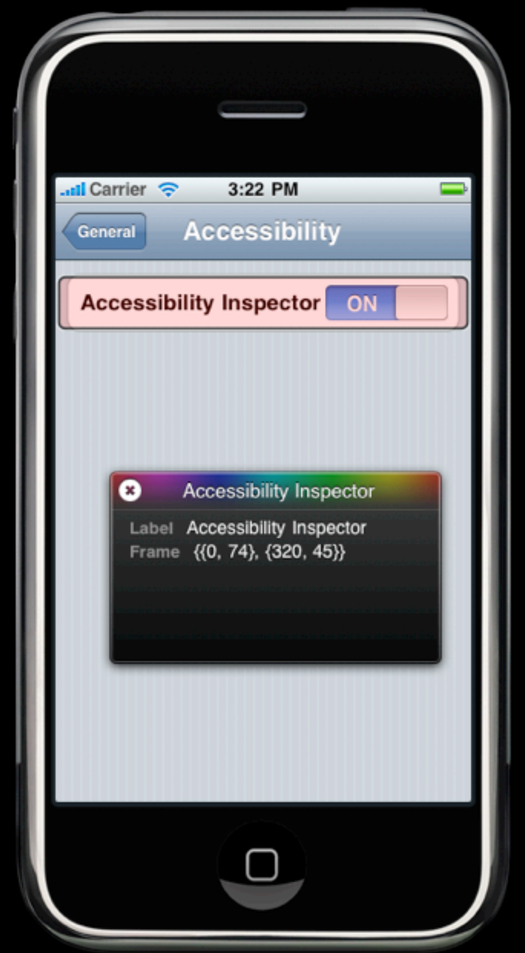




- Accessibility On/Off
- Label
- Hint
- Traits

Testing Accessibility

- Accessibility Inspector
- Settings > General > Accessibility



Adding and Testing Accessibility

Adding Accessibility Programmatically

- Accessibility can be added to programmatically created views
  - By setting accessibility attributes
  - By overriding accessibility methods

Adding Accessibility Programmatically

- If the accessibility information does not change over the course of the object's lifetime, you can use the accessibility setters

```
- (void)awakeFromNib {
    ...
    UIControl *control = [[UIControl alloc] initWithFrame:frame];

    [control setIsAccessibilityElement:YES];
    [control setAccessibilityLabel:@"Play"];

    [window addSubview:control];
    ...
}
```

Adding Accessibility Programmatically

- If the accessibility information of the object changes frequently, it may be appropriate to override methods

```
@implementation MyTemperatureView

- (BOOL)isAccessibilityElement {
    return YES;
}

- (NSString *)accessibilityLabel {
    return [_cityWeather currentTemperatureString];
}

- (UIAccessibilityTraits)accessibilityTraits {
    return [super accessibilityTraits] | UIAccessibilityTraitSummaryElement;
}

@end
```

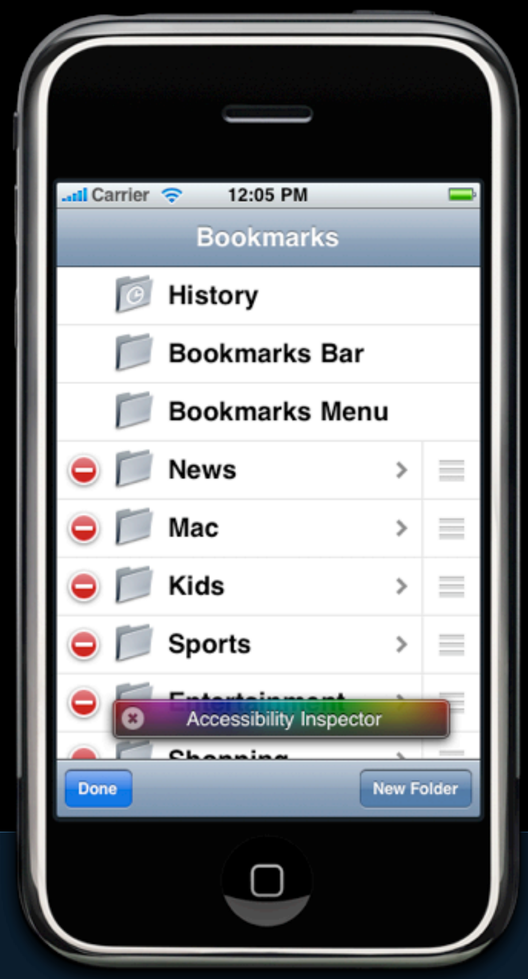
Notifications

- Screen change

  `UIAccessibilityNotificationScreenChanged`

- Layout change

  `UIAccessibilityNotificationLayoutChanged`




```
- (id)switchToBookmarks {
    ... // do necessary work to change views
    UIAccessibilityPostNotification(UIAccessibilityNotificationScreenChanged, nil);
}


- (id)beginEditingBookmarks {
    ... // do necessary work to change data
    UIAccessibilityPostNotification(UIAccessibilityNotificationLayoutChanged, nil);
}
```

Setting Accessibility Attributes

Accessibility Containers

- A UIView may contain disparate elements
- The Accessibility Container protocol allows a UIView to return accessible objects that represent “subelements”

Accessibility Containers

- A UIView that acts as a container should implement:

```
-(NSInteger)accessibilityElementCount
```

  - The number of elements the UIView contains

```
-(id)accessibilityElementAtIndex:(NSInteger)index
```

  - The element at the specified index

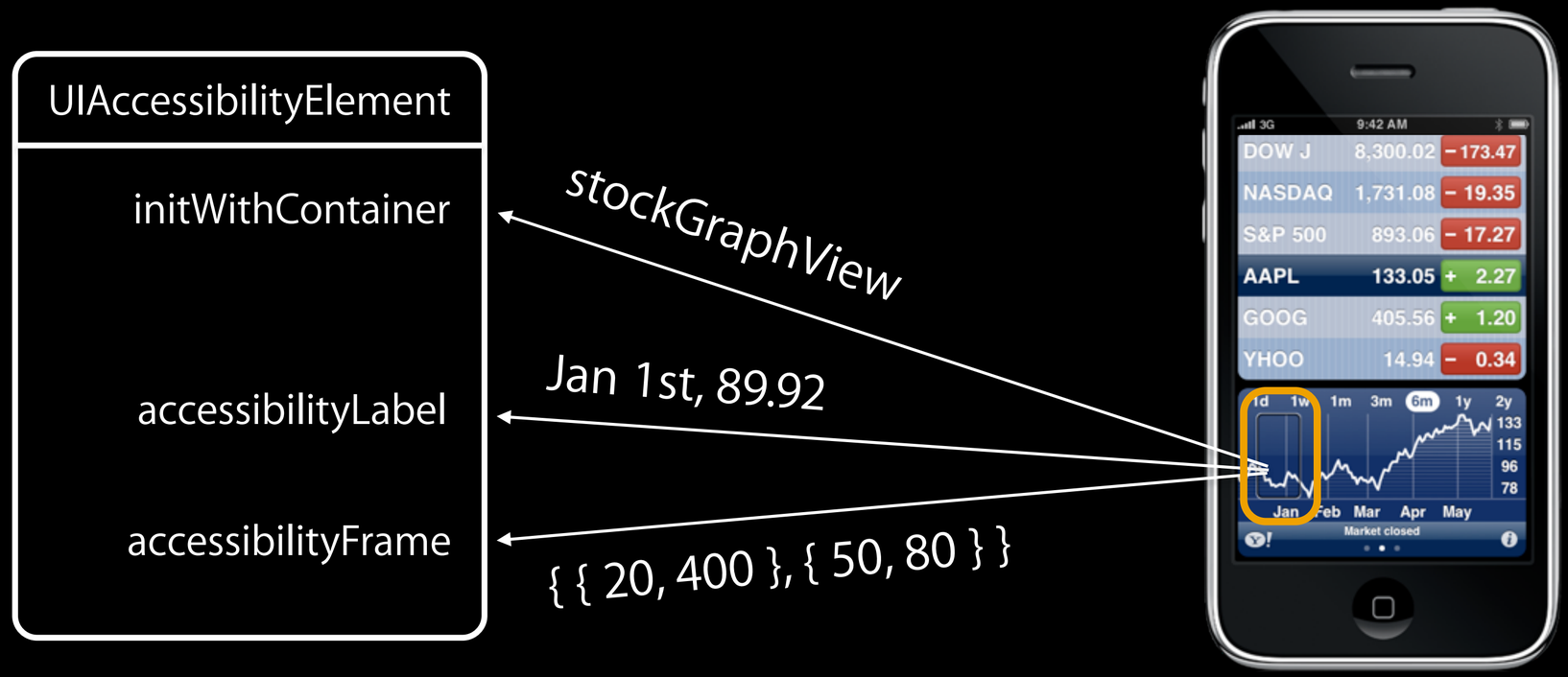
```
-(NSInteger)indexOfAccessibilityElement:(id)element
```

  - The location of the element in the list of elements

UIAccessibilityElement

- Elements in the container should be instances of UIAccessibilityElement
- UIAccessibilityElement encapsulates accessibility information

UIAccessibilityElement




```
UIAccessibilityElement *chartPart =
    [[UIAccessibilityElement alloc] initWithAccessibilityContainer:stockGraphView];
chartPart.accessibilityLabel = @"Jan 1st, 89.92";
chartPart.accessibilityFrame = CGRectMake(20, 400, 50, 80);
[_accessibilityElements addObject:chartPart];
```

Accessibility Container Protocol

Best Practices

- Use short, concise labels
  - ✅ Good: “Add city”
  - ❌ Bad: “Adds a city to the table view”

Best Practices

- Don’t include the type information in the label
  - ✅ Good: “Remove city”
  - ❌ Bad: “Remove city button”

Best Practices

- Hints should inform what happens when an element is activated—only if it is not clear

Good: “Plays a preview”

Bad: “Pressing here will play a preview of the current song”

Summary

- Accessibility expands the iPhone community
- Your apps are an important part of the accessibility story
- Adding accessibility is easy
- Use the Inspector and VoiceOver to test

Related Sessions

Enabling Your Mac Applications for Assistive Technologies (Mac OS X)	North Beach Wednesday 5:00PM
Improving Accessibility in Web Applications (Web)	Russian Hill Friday 9:00AM
Advanced Accessibility: Best Practices and New APIs in Snow Leopard	Mission Friday 2:00PM

Labs

Mac OS X Accessibility Lab	OS X Lab A Thursday 2:00PM
iPhone Accessibility Lab	iPhone Lab C Thursday 5:00PM
iPhone Accessibility Lab	iPhone Lab D Friday 2:00PM
Mac OS X Accessibility Lab	OS X Lab D Friday 2:00PM

More Information

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Documentation

Accessibility Programming Guidelines for iPhone OS
http://developer.apple.com/wwdc/attendee/sessions/

VoiceOver User Manual
http://support.apple.com/manuals/iphone

Q&A

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